ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Air Permits Program

TECHNICAL ANALYSIS REPORT
for
Air Quality Control Minor Permit No. AQ0272MSS01

BP Exploration (Alaska) Inc. (BPXA)
Lisburne Production Center

Temporary Power Provisions for Replacement of the L1 to LPC Pipeline

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Date: Final – January 16, 2007

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Abbreviations/Acronyms

AAC ..... Alaska Administrative Code
ADEC ..... Alaska Department of Environmental Conservation
AS ..... Alaska Statutes
ASTM ..... American Society of Testing and Materials
BACT ..... Best Available Control Technology
BPXA ..... BP Exploration (Alaska) Inc.
CFP ..... Central Facilities Pad
C.F.R. ..... Code of Federal Regulations
EPA ..... Environmental Protection Agency
LPC ..... Lisburne Production Facility
MPU ..... Milne Point Unit
PM1 ..... Point McIntyre Drill Site 1
PM2 ..... Point McIntyre Drill Site 2
PSD ..... Prevention of Significant Deterioration
PTE ..... Potential to Emit
RA ..... Relative Accuracy
RM ..... Reference Method
SN ..... Serial Number

Units and Measures

bhp ..... brake horsepower or boiler horsepower [1]
gr./dscf ..... grains per dry standard cubic foot (1 pound = 7,000 grains)
dscf ..... dry standard cubic foot
gph ..... gallons per hour
kW ..... kiloWatts
kW-e ..... kilowatts electric[2]
lbs ..... pounds
mmBtu ..... million British Thermal Units
ppm ..... parts per million
ppmv ..... parts per million by volume
tph ..... tons per hour
TPY ..... tons per year
wt% ..... weight percent

Pollutants

CO ..... Carbon Monoxide
HAPS ..... Hazardous Air Pollutants
H_2S ..... Hydrogen Sulfide
NO_X ..... Oxides of Nitrogen
NO_2 ..... Nitrogen Dioxide
NO ..... Nitric Oxide
PM-10 ..... Particulate Matter with an aerodynamic diameter less than 10 microns
SO_2 ..... Sulfur Dioxide
VOC ..... Volatile Organic Compound

[1] For boilers: One boiler horsepower = 33,472 Btu-fuel per horsepower-hour divided by the boiler's efficiency. For engines: approximately 7,000 Btu-fuel per brake horsepower-hour is required for an average diesel internal combustion engine.

[2] kW-e refers to rated generator electrical output rather than engine output

1. INTRODUCTION

This Technical Analysis Report (TAR) provides the Alaska Department of Environmental Conservation's (Department's) basis for issuing Air Quality Control Minor Permit No. AQ0272MSS01 to BP Exploration (Alaska) Inc. (BPXA) for the Lisburne Production Facility (LPC) Point McIntyre Drill Site 1 (PM1) and Point McIntyre Drill Site 2 (PM2). The Department received the Permittee's minor permit application on October 24, 2006. The Permittee is requesting a modification to the 140 hour limitation for two back-up generators at the PM1 and PM2 sites. The Permittee has also requested an Owner Requested Limit (ORL) for the pipeline replacement period.

2. BACKGROUND

Stationary Source Description

The stationary source is owned and operated by BPXA and BPXA is the Permittee for the stationary source's operating permit. The SIC code for this facility is 1311 – Crude Oil and Natural Gas Production. The NAICS code of this facility is 211111.

The LPC is a PSD Major Source that processes crude oil production fluids received from various crude oil accumulations located on the North Slope of Alaska, including (but not limited to) Lisburne, Point McIntyre, Niakuk, West Beach State, and North Prudhoe Bay State.

3. PROJECT DESCRIPTION

The Permittee's three phase production pipeline from pad L1 to the LPC has been shutdown due to corrosion/erosion damage. During the upcoming 2006/2007 winter construction schedule, BPXA intends to eliminate a production loss by replacing the existing pipeline. A 13.8 kilovolt (kV) power cable suspended from the existing pipe rack from pad L1 to pad L2 powers pad L1 AGI, West Beach State, the Northstar shore facility, PM1 and PM2. Since this creates a hazardous condition for construction activities in the vicinity of the power cable, the cable must be de-energized. In order to provide temporary alternate power at PM1, PM2, West Beach State, and Pad L2, the Permittee intends to use either existing generators at PM1 and PM2, plus an additional temporary backup generator to be used at PM2 during the construction period or relocate a larger single emergency generator at PM2, with a temporary emergency backup generator located at PM2. The inventory of emission units that may be used under Minor Permit No. AQ0272MSS01 for the project is provided in **Table 1**. The Permittee will use one of two emergency generator configurations, or a combination of the two, for activities at the aforementioned facilities and to prevent freezing by providing heat to the manifold building, and to maintain well control.

Table 1 – Minor Permit Emission Unit Inventory[a]

ID	Source Tag No.	Source Description	Rating/Size
29	80-891 (PM1-EDE4)	GM Detroit Allison Emergency Generator Pt. McIntyre Drill Site 1	1,377 hp [865 KW]
30	80-892 (PM2-EDE5)	GM Detroit Allison Emergency Generator Pt. McIntyre Drill Site 2	1,377 hp [865 KW]
44	80-858	Temporary Backup Diesel Generator Pt. McIntyre Drill Site 2	890 hp [600 kW-e]
45	NA	Temporary Diesel Replacement Generator Pt. McIntyre Drill Site 2	2,850 hp [2,000 kW-e]

Table Notes
a – Units 29 and 30 are currently permitted in Operating Permit No. 272TVP01

4. PROJECT EMISSIONS SUMMARY

The Permittee calculated the increase in potential to emit (PTE) in tons per year (TPY) due to the temporary construction project. The Permittee calculated emissions for NOx, CO, PM-10 and VOC using AP-42 factors from table 3.4-1 of AP-42. The Permittee calculated SO_2 emissions using sulfur mass balance. The project potential emissions shown in **Table 2** were used to evaluate the minor permit applicability. The increase in actual emissions is shown in **Table 3**, and was used to show PSD major modification applicability.

Table 2 – Minor Permit Applicability Analysis

Pollutant	Proposed Potential Emissions (TPY)[a]	Existing Potential Emissions (TPY)	PTE Increase (TPY)	Minor Permit Threshold (TPY)	Minor Permit Applicable?
NO_X	41.4	4.36	37.0	10	yes
CO	N/A	N/A	N/A	N/A	no
PM-10	1.29	0.14	1.15	10	no
SO_2	2.27	0.20	2.07	10	no
VOC	N/A	N/A	N/A	N/A	no

Table 2 Notes:
[a] Proposed potential emissions based on an estimated 221,255 gallons of fuel consumed by the existing emergency generators units ID 29 and ID 30 at PM1 and PM2.

Table 3 – PSD Applicability Analysis

Pollutant	Proposed Potential Emission (TPY)[a]	Actual Emissions from Application (TPY)	Net Change (TPY)	PSD Major Modification Threshold (TPY)	PSD Applicable?
NO_X	41.4	2.4	39	40	no
CO	10.9	0.6	10.3	100	no
PM-10	1.29	0.08	1.21	15	no
SO_2	2.27	0.08	2.19	40	no
VOC	1.16	0.07	1.09	40	no

Table 3 Notes:

[a] Proposed potential emissions based on an estimated 221,255 gallons of fuel consumed by the existing emergency generators units ID 29 and ID 30 at PM1 and PM2.

5. DEPARTMENT FINDINGS

Based on a review of the application, the Department finds that:

1. During the anticipated pipeline replacement period the Permittee has proposed an ORL to limit the total increase in NOx emissions for the project to stay below the PSD major modification threshold of 40 TPY. Condition 10 of Operating Permit No. 272TVP01 subjects the Permittee to a 140 hour operational limit in a rolling 12-month period on emission units ID 24 through ID 32, this limit was used to manage the NOx levels below the PSD major modification limit, and was established in 1994.
2. The Permittee has requested a minor permit for an ORL classified under 18 AAC 50.508(6), to revise or rescind terms and conditions of a Title I permit issued under 18 AAC 50. The department originally established these specific terms and condition in 1994 in Permit-to-Operate No. 9473-AA025 for ambient air quality protection (TPY NOx limits) and to avoid classification as a PSD major modification for NOx. These are Title I provisions. The department subsequently incorporated them into Operating Permit No. 272TVP01, and Permit-to-Operate No. 9473-AA025 has expired. The request is classified under 18 AAC 50.508(6), because the department is changing Title I provisions, even though they have already been carried over into a Title V permit.
3. Emissions units that are permitted under AQ0272MSS01 are used to provide power and heat for operation of the existing stationary source. They are not used for construction. Therefore, the resulting emissions apply toward both minor and major preconstruction permit thresholds.
4. **Table 2** shows that the project will increase potential NOx emissions by 37 TPY which makes the project classified under 18 AAC 50.502(c)(3); as this project will exceed the NOx minor permit threshold of 10 TPY.
5. The total net NO_x limit allowed for the pipeline replacement period is 39 TPY which is below the 40 TPY PSD major modification limit.
6. The Permittee shall accurately monitor and report the total cumulative fuel consumption for the project's emergency generators so accurate emissions calculations can be made. This

shall be accomplished through accurate monitoring of the fuel deliveries. The Permittee must start the fuel delivery measurement period with full tanks and end the project with full tanks. As an alternative to filling the fuel tanks at the end of the project, the Permittee may assume that the entire tank of fuel has been consumed and the total tank volume amount shall be used to calculate emissions, this applies to all dedicated tanks for the emission units covered by this permit have not had a final refill to full by the conclusion of the project so accurate fuel consumption measurements are achieved.

7. The Department has established a factor for unguaranteed and AP-42 emissions factors, to add a conservative margin to keep the emissions generated below the PSD major modification limit. Since the emission factors have some inherent error associated with them, the Department added this 10% factor to account for the maximum error possible for the AP-42 or unguaranteed vendor emission factors which are nominal factors that may not necessarily represent the maximum engine emission rates. The Department will allow the Permittee, to have the option, to remove the need to multiply their calculated emissions by the 1.1 factor, established in section 4 of the Minor Permit No. AQ0272MSS01, by performing either a source test or using vendor guaranteed emission factors. If the generator configuration that is operating has not successfully completed a source test and is not using vendor guaranteed emission factors, it will be subject to the 1.1 factor. Since Emission Units 29 and 30 are of identical make, model and configuration a source test on either of the engines may be used to estimate emissions from both engines.

8. The Department will allow the Permittee to replace Emissions Units IDs 29 and 30 with Emission Unit ID 45 or Emission Unit ID 45 with Emission Units IDs 29 and 30. The Permittee shall not operate Emission Unit ID 45 simultaneously with Emission Unit ID 30, except during a power transition period that cannot exceed 3 hours to shift operations from one configuration to another.

9. Minor Permit No. AQ0272MSS01 requires the Permittee to monitor, record, and report as described in Operating Permit No. 272TVP01, this is because the minor permit is contained under Clean Air Act section 502(b)(10), which requires that all Title V monitoring, recordkeeping and reporting be maintained.

10. Lisburne Production Center is located in the North Slope Borough coastal district. This project is consistent with the Alaska Coastal Management Program (ACMP) through AS 46 40 040(b)(1). The Department notified the local district and resource agencies of the project on November 14, 2006. The local agencies did not request additional ACMP review through 6 AAC 50.810.

11. As described in 18 AAC 50.540(c)(2), an application for a minor permit classified under 18 AAC 50.502 must include a demonstration showing the proposed increase in PTE will not interfere with the attainment or maintenance of the ambient air quality standards. The Permittee's application included an ambient demonstration for NOx. The Department reviewed the analysis and added conditions 6, 7, 8, 9, 10, 10.1, and 10.2 for ambient air quality protection.

12. Source testing may be accomplished per approved State and EPA approved methods in 18 AAC 50.220 to determine revised emissions factors. A test plan must be submitted and approved prior to commencing the testing. These emission factors, upon approval by the

Department, shall be used to retroactively re-calculate the daily, monthly and project total net NO_x emissions for the emergency generators.

13. The Permittee has requested some self imposed limitations that the Department has included in the permit, these are:
    - Minor Permit AQ0272MSS01 condition 11 has terms for the expiration of certain conditions of the permit and for the permit itself;
    - drill rig operations at PM1 are not permitted for the full period of the construction;
    - the trailer that houses emissions unit ID 29 at PM1 is to be rotated 90 degrees counterclockwise as shown in Figure 1 in Attachment A, and that configuration must be maintained beyond the time of this permit;
    - the Permittee must notify the Department in writing, no later than 10 days in advance of the anticipated date that construction will begin, notification may be provided by the Permittee prior to issuance of the permit.
14. The application satisfies the applicable requirements set out in 18 AAC 50.540.

6. PERMIT REQUIREMENTS

State regulations in 18 AAC 50.544 describe the elements that the Department must include in minor permits. This section of the TAR provides the technical and regulatory basis for the permit requirements in Minor Permit No. AQ0272MSS01, which is classified under 18 AAC 50.502(c)(3) .

6.1 General Requirements for All Minor Permits

As described in 18 AAC 50.544(a), each minor permit issued under 18 AAC 50.542 must identify the stationary source, the project, the Permittee, and contact information;

The permit cover page identifies the stationary source, the project, Permittee, and contact information.

6.2 Fee Requirements

The Department determined the assessable emissions by adding the maximum NOx, SO_2, PM-10 and CO emissions for the temporary pipeline replacement project. The total assessable emissions for this project are 52.3 tons.

BPXA will need to add the assessable emissions from the temporary pipeline replacement project to the existing assessable emissions for the stationary source. This approach is different than the Department's typical practice of revoking the existing source-wide sum and issuing a new source-wide sum. The Department took this alternative approach to minimize the confusion that would occur due to the temporary nature of the pipeline replacement project at the stationary source. Without this approach, Minor Permit No. AQ0272MSS01 would revoke the source-wide sum in Operating Permit No. 272TVP01 and then require a future permit application to revert the Operating Permit No. 272TVP01 assessable emissions back to the previously permitted assessable emissions after the temporary pipeline replacement project emissions are paid through the operating permit assessable emission process.

6.3 Emission Unit-Specific Requirements

a. Ambient Air Quality Standards – 18 AAC 50.544(c)(1)

The permittee submitted an ambient air quality modeling assessment to demonstrate that they can comply with the Alaska Ambient Air Quality Standards (AAAQS) listed in 18 AAC 50.010. Minor Permit No. AQ0272MSS01 is a temporary construction permit and does not need to comply with increments as listed in 18 AAC 50.020. The Department reviewed the modeling assessment and concurs that the revisions authorized by Minor Permit No. AQ0272MSS01 will comply with AAAQS. The Department's review of the assessment is included in Appendix B of this TAR. The ambient air quality protection requirements are contained in Section 3 of the minor permit.

b. State Emission Standards – 18 AAC 50.544(c)(2)

(i) State Emission Standards for Visible Emissions

The replacement diesel fuel-fired generator (Unit ID 45) is subject to 18 AAC 50.055(a) for visible emissions.
Because diesel-fired engines have the potential to exceed visible emissions standards, the Department is requiring the Permittee to verify compliance by conducting visible emissions surveillance within 30 days of startup of Emissions Unit 45. This may be accomplished with a single 40 CFR 60, Appendix A, Reference Method 9 observation.

(ii) State Emission Standards for Particulate Matter

The replacement diesel fuel-fired generator (Unit ID 45) is subject to 18 AAC 50.055(b) for PM emissions.

The Permittee provided a compliance demonstration using manufacturer's data for Emission Unit 45. The calculation was 0.01 grains per cubic foot (gr./dscf) and this is far below the established limit of 0.05 grains per cubic foot (gr./dscf).

(iii) State Emission Standards for Sulfur Dioxide

The replacement diesel fuel-fired generator (Unit ID 45) is subject to 18 AAC 50.055(c) for SO_2 emissions.
The Department has previously calculated that emission units burning distillate fuel with less than 0.75 percent sulfur by weight will comply with the state SO_2 emission standard of 500 ppm. Since the American Society of Testing and Materials (ASTM) limits fuel sulfur to less than 0.5 percent (by weight) for diesel fuel, the Department is not including any initial compliance requirements in the minor permit for the diesel-fired emission units. The Permittee may show compliance with the state sulfur standard for distillate fuel burning equipment by keeping records of the sulfur content of fuel consumed by Emission Unit ID 45.

c. Equipment Maintenance – 18 AAC 50.544(c)(3)

As described in 18 AAC 50.544(b)(2), the permit must include maintenance of equipment according to the manufacturer's or operator's maintenance procedures, keep records, and keep a copy of the maintenance procedures

6.4 Temporary Pipeline Replacement Permit Conditions

Section 4 of the minor permit contains conditions allowing the Permittee to swap out the generators and modify the NO_x emission limit. The Department is temporarily rescinding Condition 10 for Emission Units ID's 29 and 30 which is a Title I condition contained in Operating Permit No. 272TVP01, for the Pemittee's temporary pipeline replacement permit. The Permittee is avoiding PSD major modification classification for NO_x. This is being accomplished by limiting the total net project NO_x emissions increase for the pipeline replacement period for emergency generators, ID's 29, 30 and 45, to no greater than 39 tons. Emissions will be calculated for the emergency generators, ID's 29, 30 and replacement unit ID 45, by monitoring total fuel deliveries, determining the total fuel consumption for each unit, and multiplying this by an emission factor in lb of emissions per gallon of fuel consumed. Depending upon the type of emissions factor used to estimate emissions, the Permittee shall be required to adjust the emissions by 10 percent for vendor unguaranteed or AP-42. The Department is requiring the Permittee to calculate emissions within 24 hours of receiving fuel delivery. The Permittee shall use the emissions calculated to verify compliance to the emission allowances. Emission Unit ID 44 is not included in the emission calculations as it is classified as a non-road engine and it emissions do not count towards the project emissions.

6.5 Recordkeeping, Reporting, and Certification Requirements

All air quality control permits must contain procedures for recordkeeping, reporting, and certification.

Information request and certification requirements in Section 5 of the minor permit are specifically required under 18 AAC 50.200 and 18 AAC 50.205, respectively.

6.6 Terms to Make Permit Enforceable

As described in 18 AAC 50.544(i) a minor permit classified under 18 AAC 50.508(6) must contain terms and conditions as necessary to ensure that the Permittee will construct and operate the stationary source in accordance with 18 AAC 50. These requirements are contained in Section 6 of the minor permit.

7. PERMIT ADMINISTRATION

7.1 When You Can Operate Under This Permit

BPXA may operate under the conditions of Minor Permit No.AQ0272MSS01 upon issuance. The Department considers the Title I permit changes made by the minor permit to be Clean Air Act 502(b)(10) changes for the purpose of Title V permitting. Section 502(b)(10) changes are defined in 40 CFR 71.2 as

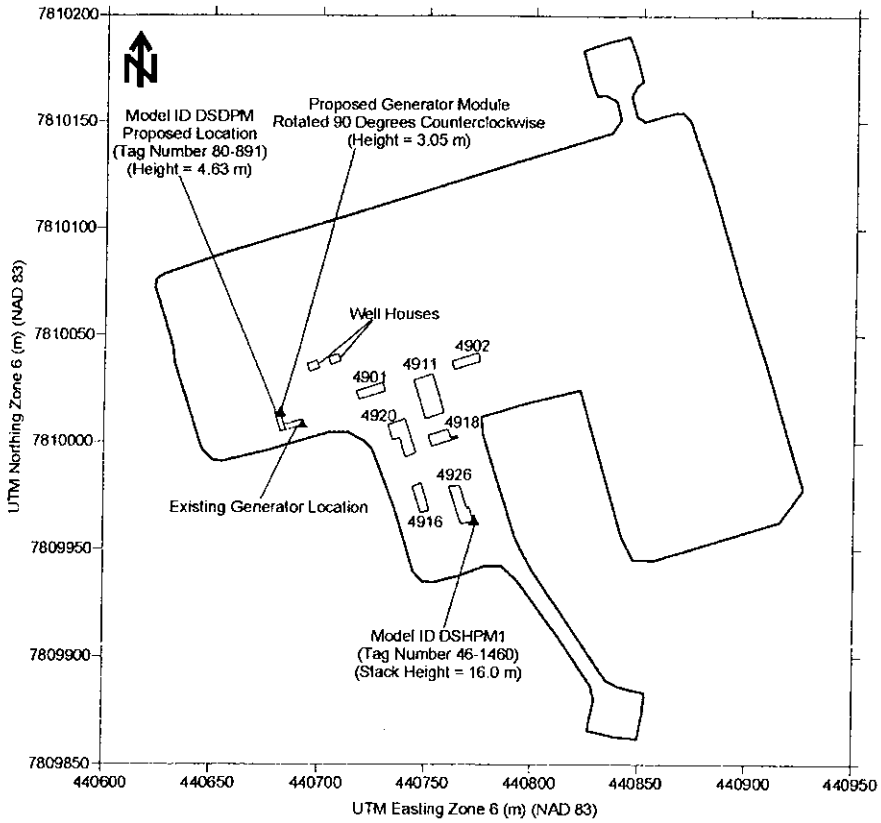
> *changes that contravene an expressed permit term. Such changes do not include changes that would violate applicable requirements or contravene federally enforceable permit terms and conditions that are monitoring (including test methods), recordkeeping, reporting, or compliance certification requirements.*

40 C.F.R. 71.6(a)(13)(i) allows the [Title V] permittee to make section 502(b)(10) changes without a permit revision if the changes are not Title I modifications, *and the changes do not exceed emissions allowable under the permit (whether expressed therein as a rate of emissions or in terms of total emissions.)* For the purposes of changes to Title V permits, lacking EPA

guidance to the contrary, the department considers Title I modifications to be PSD major modifications, and modifications under NSPS or under CAA Section 112. Therefore, this is not a Title I modification for this purpose. The department considers this to be a change that is allowed without a Title V revision because any existing permit limit that would be exceeded is not for allowable emissions expressed in the permit as a rate or total emissions.

FIGURE 1

LPC PM1 PAD LAYOUT
SHOWING ROTATED GENERATOR HOUSING



Attachment A

Attachment B

MEMORANDUM

State of Alaska

DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Air Quality

TO: File

DATE: December 04, 2006

THRU:

FILE NO: AQ0272MSS01

PHONE: 465-5100
FAX: 465-5129

FROM: Alan E. Schuler, P.E.
Environmental Engineer
Air Permits Program

SUBJECT: Review of BPXA's Ambient Assessment for Lisburne

This memorandum summarizes the Department's findings regarding the ambient assessment submitted by BP Exploration (Alaska) Inc. (BPXA) in support of their minor permit application (AQ0272MSS01) for the Lisburne pipeline repair project. BPXA intends to temporarily operate the Point McIntyre 1 (PM1) and/or the Point McIntyre 2 (PM2) emergency generators in excess of their existing permit limits while replacing sections of a pipeline. The project may also require the use of an additional temporary generator at PM2. As described in this memorandum, BPXA's analysis adequately shows that operating their emission units within the requested constraints will not cause or contribute to a violation of the Alaska Ambient Air Quality Standards (AAAQS) provided in 18 AAC 50.010.

BACKGROUND

BPXA desires to replace corroded sections of the three phase pipeline between pad L1 and the Lisburne Production Center (LPC). The project will require BPXA to de-energize a 13.8 kV electrical cable which is suspended from the pipe rack. The cable is used to power pads L1, AG1, West Beach State, the Northstar shore facility, PM1 and PM2. BPXA will therefore need to temporarily power these pads via the PM1/2 emergency generators, and/or a temporary generator at PM2.

The project triggers minor permit review for the following two reasons:

1) the project emissions exceed the threshold in 18 AAC 50.502(c)(3) for oxides of nitrogen (NOx); and
2) the application includes a request under 18 AAC 50.508(6) to revise terms and conditions of an existing Title I permit.

Applicants subject to 18 AAC 50.502(c)(3) must provide an ambient AAAQS analysis for the triggered pollutants per 18 AAC 50.540(c)(2). Applicants subject to 18 AAC 50.508(6) must show the effect of revising or revoking the permit term or condition per 18 AAC 50.540(k)(3). The existing Lisburne permit contains provisions to project the nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and particulate matter (PM-10) AAAQS and maximum allowable increase (increment). BPXA was required to demonstrate compliance with the NO_2, SO_2 and PM-10 AAAQS.

BPXA was not required to demonstrate compliance with the increments. The repair project is a "temporary construction activity," which is defined under 18 AAC 50.990(107) as "construction that is completed in 24 months or less from the date construction begins." Emissions associated with temporary construction activities do not consume increment per 18 AAC 50.215(b)(2)(A). Therefore, since the project will be completed by May 31, 2007 (i.e., within 24 months) an increment analysis is not required. The Department is incorporating the May 31, 2007 completion date as a permit sunset date in order to protect the NO_2, SO_2 and PM-10 increments.

BPXA desires the flexibility to conduct drilling operations at PM2 during the pipeline repair project. Drilling is currently authorized under the transportable drilling permit 455TVP01, which includes terms and conditions to protect the AAAQS. Since the PM2 project emissions are less than the non-drill rig emissions used in support of the drilling permit the Department did not require an additional near-field assessment at PM2.[3] However, the Department is imposing the owner requested limit of 226,600 gallons of fuel for the project emission units (or the NOx emissions equivalent) as a permit condition in order to protect the AAAQS at PM2.[4]

BPXA could not use the drill rig assessment for the PM1 operation since the project SO_2 emissions at PM1 exceed the C-pad SO_2 emissions. BPXA therefore requested a permit condition to prohibit drilling and well maintenance operations at PM1 during the pipeline repair project. BPXA also noted that the previous assessment for Lisburne (described in my November 3, 2000 memorandum, "Review of Lisburne X83 Modeling Analysis") contained a stack height error for the PM1 emergency generator. Therefore, BPXA submitted a new NO_2, SO_2, and PM-10 assessment for PM1. The new assessment includes the proposed pipeline repair emissions.

BPXA submitted the PM1 ambient analysis with their application. They submitted the building downwash files on November 9, 2006. BPXA submitted a revised PM1 assessment, in response to Department comments, on December 1, 2006. Today's memorandum regards the revised PM1 assessment and only describes those aspects which have changed subsequent to the 2000 Lisburne analysis, or that otherwise warrant discussion.

[3] BPXA's transportable drilling analysis included an assessment of the ambient air quality impacts while drilling at Milne Point C-Pad. BPXA provided this analysis as a worst-case scenario of drilling at a pad that also has permanent emission units. Since the long-term and short-term project emissions at PM2 are less than the corresponding emissions at C-Pad (see Table 4 of BPXA's October 17, 2006 submittal), BPXA's C-Pad analysis is adequate for PM2.

[4] BPXA later reduced the 226,600 gallon limit to avoid classifying the project as a PSD-major classification. The Department is nevertheless referencing the original 226,600 gallon limit in this memorandum since this is the value used in the modeling analysis.

APPROACH

BPXA used computer analysis (modeling) to predict the ambient air quality impacts. SECOR International Incorporated (SECOR) conducted the analysis on behalf of BPXA.

Model Selection

BPXA continued to use their modified version of the U.S. Environmental Protection Agency's (EPA's) *Industrial Source Complex Short-Term 3* (ISCST3) model for the ambient analysis. ISCST3 is an appropriate model for this analysis. BPXA used the current version (02035).

SECOR modified ISCST3 to characterize horizontal/capped stacks in a manner consistent with EPA guidance. [5] The modified version ignores stack tip downwash for horizontal/capped stacks. The Department has previously accepted this code change in a number of other assessments conducted by SECOR in support of North Slope applicants.

Meteorological Data

ISCST3 requires hourly meteorological data to estimate plume dispersion. According to EPA's Guideline on Air Quality Models (Guideline), five years of adequately representative data should be used (when available) to account for year-to-year variation. BPXA used the same five years (1991-1995) of Prudhoe Bay Unit (PBU) Pad A surface data and Barrow upper air data as used in the 2000 assessment.

Emission Rates and Source Characterization

BPXA made the following changes from the 2000 Lisburne assessment:

- BPXA originally requested a 226,600 gallon *cumulative* fuel limit for the PM1 emergency generator (Emission Unit 29), the PM2 emergency generator (Emission Unit 30), and the temporary PM2 generator. In order to maintain project flexibility, BPXA assumed the PM1 and PM2 emergency generators *each* consume the entire 226,600 gallon limit in the PM1 ambient assessment. This equates to 42.4 tons per year (tpy) of NOx emissions from each emergency generator.
- BPXA reduced the PM1 generator stack height from the previously modeled 15.5 meters to the actual 4.63 meters.
- BPXA rotated the trailer that houses Emission Unit 29 (PM1 emergency generator) 90 degrees counterclockwise to resolve a cavity downwash concern with the PM1 generator stack. The Department is including a permit condition to require this rotation.

BPXA did not include an additional stack for the PM2 temporary generator since the emissions were already accounted for in the PM2 emergency generator. The Department is therefore requiring the PM2 temporary generator stack to have a stack height that is no less than the PM2 emergency generator stack height (4.3 meters).

[5] EPA Memorandum from Joseph Tikvart to Ken Eng, *Proposal for Calculating Plume Rise for Stacks with Horizontal Releases or Rain Caps for Cookson Pigment, Newark, New Jersey*, July 9, 1993.

Horizontal/Capped Stacks
The presence of non-vertical stacks or stacks with rain caps requires special handling in an ISCST3 analysis. For capped and horizontal stacks, EPA recommends that the plumes be characterized with an artificially small exit velocity (0.001 m/s) and an artificially large diameter (as needed to maintain the actual exhaust flow rate). BPXA used this approach to model the LPC flare, which has a horizontal release.

Ambient Air Boundary and Receptor Grid
BPXA used the same ambient air boundary (pad edge) and receptor grid as previously used. The Department continues to accept this boundary and grid.

Ambient NO_2 Modeling
The modeling of ambient NO_2 concentrations can sometimes be refined through the use of ambient air data or assumptions. BPXA continued to use the national default ambient NO_2-to-NOx ratio of 0.75, as provided in the Guideline, to refine the estimated ambient NO_2 concentrations. The 0.75 ratio is appropriate for this analysis.

Short-term Impacts
EPA allows applicants to compare the high second-high (h2h) modeled concentration to the short-term air quality standards if at least one year of temporally representative site-specific, or five years of representative off-site data, are used. The Department allowed BPXA to compare the h2h SO_2 concentration to the short-term standards since they used five years of meteorological data.

EPA also allows the 24-hour PM-10 ambient concentration to be modeled as the "highest sixth-high" (h6h) impact over a five-year meteorological period. This approach is less conservative than using the h2h impact in any one year, but better matches the PM-10 monitoring method upon which the standard is based. BPXA used the h6h approach to model the 24-hour PM-10 ambient impacts.

RESULTS AND DISCUSSION

The maximum AAAQS impacts are shown in Table 1. The background concentrations, total impacts, and ambient standards are also shown. The total impacts are well below the AAAQS. Therefore, BPXA has demonstrated compliance with the AAAQS.

It is important to note that since ambient concentrations vary with distance from each emission unit, the maximum value represents the highest value that may occur within the area. The concentrations at other locations within the area are less than the values reported above.

Table 1: Maximum AAAQS Impacts
Lisburne PM-1 Pad

Air Pollutant	Avg. Period	Maximum Modeled Conc ($\mu g/m^3$)	Bkgd Conc ($\mu g/m^3$)	TOTAL IMPACT: Max conc plus bkgd ($\mu g/m^3$)	Ambient Standard ($\mu g/m^3$)
NO_2	Annual	24.5	5.6	**30**	100
SO_2	3-hr	71.4	55	**126**	1,300
	24-hr	59.3	10	**69**	365
	Annual	1.1	3	**4**	80
PM-10	24-hr	30.0	57	**87**	150
	Annual	0.7	7	**8**	50

CONCLUSION

The Department reviewed BPXA's modeling analysis for the Lisburne pipeline repair project at PM1 and concluded the following:

1. The NOx, SO_2 and PM-10 emissions associated with operating the proposed emission units will not cause or contribute to a violation of the AAAQS listed in 18 AAC 50.010.
2. BPXA's modeling analysis fully complies with the showing requirements of 18 AAC 50.540(c)(2).
3. BPXA conducted their modeling analysis in a manner consistent with EPA's *Guideline on Air Quality Models*.

The Department developed conditions in minor permit AQ0272MSS01 to ensure BPXA complies with the AAAQS while conducting the temporary pipeline repair project. These conditions are summarized below.

1. The existing PM1 emergency generator (Emission Unit 29), the PM2 emergency generator (Emission Unit 30), and the temporary PM2 generator, may not consume more than 226,600 gallons, combined, during the temporary construction period;[6]
2. BPXA may not conduct drilling and well maintenance operations at PM1 during the temporary construction period;
3. The minor permit will expire on May 31, 2007;
4. The PM1 generator trailer must be 90-degrees counterclockwise using the current southwest corner of trailer as the rotation axis; and
5. The PM2 temporary generator stack must have a vertical release that is at least 4.3 meters above grade.

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[6] The 226,600 gallon fuel limit may be expressed as a ton per year NOx limit, or some other term that provides an equivalent annual operating restriction.